



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,838	08/05/2004	SOLOMON ZAROMB		4837

7590 06/26/2009
SOLOMON ZAROMB
9S 706 WILLIAM DR
BURR RIDGE, IL 60527

EXAMINER

RAMDHANIE, BOBBY

ART UNIT	PAPER NUMBER
----------	--------------

1797

MAIL DATE	DELIVERY MODE
-----------	---------------

06/26/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/710,838	Applicant(s) ZAROMB ET AL.	
	Examiner BOBBY RAMDHANIE	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/26/2009 has been entered.

Terminal Disclaimer

2. The terminal disclaimer does not comply with 37 CFR 1.321(b) and/or (c) because:

3. A). No fee has been submitted for the Terminal Disclaimer.
4. B). No fee authorization form has been submitted.
5. C). No printed names under signature.
6. D). No assignment has been disclosed and/or assigned.
7. E). No 3.73(b) statement has been submitted.

Response to Amendment

Claim Objections

8. Claims 7 & 8 are objected to because of the following informalities: The preamble of both claims recites, "The improvement of Claim 6," but Claim 6 is directed toward a method. Appropriate correction is required.

Response to Arguments

9. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection are necessitated by Applicant's amendments to the claims.

Claim Rejections - 35 USC § 112

10. Claims 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claim 12 to recite, "In a wet electrostatic precipitation-based apparatus, a method..." It is unclear if the Applicant is claiming an apparatus or a method. For the purposes of examination, the Examiner will examine the claim as if the Applicant is attempting to claim a method.

Claim Rejections - 35 USC § 103

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1-3, 5-7, & 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bentley in view of Grindell and/or Hardt et al (US3765154).

13. Applicant's claims are toward a method.

14. Regarding Claims 1-3, 5, & 9-19, Bentley discloses in a wet electrostatic precipitation-based apparatus for detecting the presence of an airborne chemical or biological analyte, the improvement comprising: A). A gas-and liquid-containing chamber (See Figure 3 Item 3); B). Means for introducing an analyte-free collection liquid into said chamber (See Figure 3 Item 26 or Figure 1, Liquid); C). Means for rapidly sampling a volume of ambient air and transferring said analyte therefrom into said collection liquid (See Figure 3 Item 25, & See Figure 1, Gas), D). Said sampling means comprising an air intake means and an air venting means and means for removing from said chamber an analyte-enriched collection liquid (See Figure 3) ; E). Wherein said volume of air passes through substantially horizontal air inlet and thence through an electrically conductive collector electrode tube (See Figure 3 Electrostatic Precipitator)

Art Unit: 1797

said removing means comprises means for feeding said enriched liquid to an appropriate detector or storing said liquid for subsequent analysis (See Figure 2 Items 17 & 22 and Figure 3 Item 17).

15. Bentley et al does not disclose that the electrically conductive collector electrode is substantially vertical or that there is a means for applying and adjusting an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said collector tube and discharge electrode forming part of said chamber, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field.

16. Bentley et al does however disclose that the electrostatic precipitator does generate ionized particles that could be driven toward said collector electrode by an electric field (See Column 3 lines 30-36; the electrostatic precipitator essentially performs this function).

17. Grindell discloses a substantially vertical electrostatic precipitator in which the collector electrode is substantially vertical and a means for applying and adjusting an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said collector tube and discharge electrode forming part of said chamber, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field (See Column 2 lines 24-42).

Art Unit: 1797

18. Hardt et al also discloses in a wet electrostatic precipitator, a substantially vertical electrostatic precipitator (See Figure 2) and a means for applying and adjusting an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said collector tube and discharge electrode forming part of said chamber, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field (See Column 6 lines 50-56; Item 7 and electric supply conductors).

19. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the wet electrostatic precipitation based apparatus of Bentley et al with the substantially vertical electrostatic precipitator and collector tubes of Grindell and/or Hardt et al, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893) and because Hardt et al discloses that the electrostatic precipitator has been found suitable for use in practically all phases of industrial chemistry and for the cleaning of air or gases used therein or discharged therefrom (See Column 5 lines 57-63).

20. Additional Disclosures Included: Claim 2: The apparatus of claim 1, comprising means for introducing a fine mist of droplets into said collector tube so as to cause substantially full wetting of the inner surface of said tube by a liquid film (See Bentley et al; Column 1 lines 48-49 & Column 3 lines 33-35); Claim 3: Wherein said mist is generated by an ultrasonic humidifier (See Bentley et al; Column 1 lines 48-49); Claim 5: In a wet electrostatic precipitation-based method for detecting the presence of an

Art Unit: 1797

airborne chemical or biological analyte, the improvement comprising the steps of: A). Providing a gas- and liquid- containing means (See Bentley et al; Figure 1 & Figure 3 Item 3); B). Introducing an analyte-free collection liquid into said containing means (See Bentley et al; Figure 1; Liquid & Figure 3 Item 26); C). Rapidly sampling a volume of ambient air through a sampling means forming part of said containing means and comprising an air intake means and an air venting means and transferring said analyte therefrom into said collection liquid, by passing said volume of air through a substantially horizontal air inlet and thence through a substantially vertical collector electrode tube (See Bentley et al; Figure 1 & Figure 3 in view of Grindell Figure 1 or Hardt et al Figure 2) and while applying an electric field between said tube and a co-axial spiked wire- or rod-shaped discharge electrode, wherein said electric field is high enough to effectuate a corona discharge so as to generate ionized particles that could be driven towards said collector electrode by an electric field (See Bentley et al; Electrostatic precipitator & Rejection to Claim 1 & Grindell) and removing from said containing means an analyte-enriched collection liquid and either feeding it to an appropriate detector or storing it for subsequent analysis (See Bentley et al; Figure 1 Item 17 and See Figure 3 Item 17); Claim 9: Wherein said collector electrode is tube-shaped with its inner surface electrically conducting (See Grindell Column 3 lines 54-60 & Hard et al; Column 1 lines 24-51); Claim 10: Wherein said collector electrode is a metal or other electrically conductive material or comprises an electrically conductive coating or foil applied to the inner surface of a non-conductive tube (See Grindell Column 3 lines 54-60 & Hard et al; Column 1 lines 24-51); Claim 11: Wherein said

Art Unit: 1797

collector electrode has a roughened preferably sandblasted inner surface (See Column 2 lines 58-66); Claim 12: In a wet electrostatic precipitation-based apparatus, a method of capturing for detection aerosolized particles as small as 0.01 micron in size from a volume of air which comprises passing said air through an electrostatic precipitation-based aerosol collector, wherein said collector comprises a vertical collector electrode tube and a co-axial spiked wire or rod-shaped discharge electrode (See Rejections to Claim 1 & See Bentley et al Summary of Invention lines 23-26, Column 2 lines 10-17; Grindell Column 1 lines 14-36; smoke particles from natural materials and combustion are within the 0.01-0.1 micron size range); Claim 13: Wherein said particles are virus particles (See Bentley et al Column 1 lines 33-36); Claim 14: Wherein said particles are toxin particles (See Rejections to Claim 1 & See Bentley et al Summary of Invention lines 23-26, Column 2 lines 10-17; Grindell Column 1 lines 14-36; smoke particles from natural materials and combustion are within the 0.01-0.1 micron size range); Claim 16: Means for assuring that said liquid film be at least 25 microns thick, so as to minimize collection losses due to captured particles adhering too firmly to the collector electrode (See Grindell Column 3 lines 49-60; porous or multi-channel material steel or metal wool & Hardt et al; Column 2 lines 58-66 & Column 7 line 62 to Column 8 line 4); Claim 17: Comprising means for said liquid film by dripping liquid from the top down a roughened, preferably sandblasted, metal surface and/or by liquid droplets that are carried by the sampled air (See Hardt et al (See Column 2 lines 58-66 & Column 7 line 62 to Column 8 line 4); Claim 18: The apparatus of claim 16, comprising means for fine-tuning the thickness of said liquid film by adjustments of the power of an exhaust air

Art Unit: 1797

blower and of the inter-electrode voltage and electric field distribution such as to assure that the introduced mist results in proper wetting of the collector electrode without causing unwanted spark discharges (See Rejection to Claim 1; the combination of reference are capable of being used in the recited intended use); and Claim 19: Wherein said electrodes and said electric field are so designed as to generate a sufficient corona to ionize most of the particles in the air stream and a sufficient electric field to deposit most of these particles at the collector electrode, and wherein the length and diameter of said collector electrode are such as to allow an adequate residence time for most particles to reach it rather than be carried away with the air stream (See Rejections to Claim 1; the electrodes are designed as claimed).

21. Regarding Claims 6 & 7, Bentley et al discloses the method of claim 5, comprising the step of introducing a fine mist of droplets into the air stream passing through said collector tube so as to cause substantial wetting of the inner surface of said tube by a liquid film.

22. Bentley et al does not explicitly disclose that the wetting is substantially full wetting. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of introducing a fine mist of droplets into the air stream passing through said collector tube so as to cause substantial full wetting of the inner surface of said tube by a liquid film to increase the rate at which collecting the fluid/liquid can be done thereby reducing the acquisition time of the sample, and since it

Art Unit: 1797

has been held that the provision of adjustability, where needed, involves routine skill in the art . In re Stevens, *101 USPQ 284 (CCPA 1954)*.

23. Additional Disclosures Included: Claim 7: Wherein said mist is generated ultrasonically (See Bentley et al; Column 1 lines 48-49).

24. Regarding Claim 15, the combination of Bentley et al, Grindell, and Hardt et al, discloses the apparatus of claim 1, comprising means for keeping said central wire-or rod- shaped discharge electrode at a high negative or positive potential possibly of as much 10 KV or higher, and wherein said collector electrode is tube-shaped with its inner surface electrically conducting, and said horizontal tubular air intake permits air to enter unimpeded at a high flow rate (See Rejections to Claim 1). The combination does not explicitly disclose that the flow rate is possibly as high as 500 liters/minute or higher.

25. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus to have a flow rate possibly as high as 500 liters/minute or higher, with a minimal pressure drop to reduce the amount of time needed to collect the particles for analysis and since it has been held that the provision of adjustability, where needed, involves routine skill in the art. In re Stevens, *101 USPQ 284 (CCPA 1954)*.

26. Claims 4, 8, & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Bentley et al and Grindell and/or Hardt et al and in further view of Liu et al (US6221136).

Art Unit: 1797

27. Applicants' claims are toward an apparatus.

28. Regarding Claim 4, the combination of Bentley et al and Grindell and/or Hardt et al discloses the apparatus of claim 2, except for comprising a means for generating and transmitting ultrasonic waves across the interface between said tube and said liquid film so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film.

29. Liu et al discloses an electrostatic precipitator which comprises an ultrasonic droplet generator which is used to pick up droplets in the space above an agitated liquid produced by ultrasonic agitation using an ultrasonic transducer. The dry particulate matter will be precipitated along with the added liquid droplets in the precipitator and be carried away by the liquid stream resulting from the collected droplets, thereby preventing the build up of dry solid material on the collecting electrode in the precipitator (See Column 10 lines 13-32).

30. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Bentley et al and Grindell and/or Hardt et al with an ultrasonic transducer in conjunction with the electrostatic precipitator to remove the solid particulate from accumulating on the collector electrode because the build up on the electrodes would act as an insulator layer and therefore require a higher voltage to attract more particulates out of the mist/gas stream as time goes on.

31. Regarding Claim 8, the combination of Bentley et al and Grindell and/or Hardt et al discloses the method of Claim 6, except for comprising the step of generating and transmitting ultrasonic waves across the interface between said tube and said liquid film

Art Unit: 1797

so as to help transfer particles or biological cells adhering to the tube surface from said surface into said film.

32. Liu et al discloses an electrostatic precipitator which comprises an ultrasonic droplet generator which is used to pick up droplets in the space above an agitated liquid produced by ultrasonic agitation using an ultrasonic transducer. The dry particulate matter will be precipitated along with the added liquid droplets in the precipitator and be carried away by the liquid stream resulting from the collected droplets, thereby preventing the build up of dry solid material on the collecting electrode in the precipitator (See Column 10 lines 13-32).

33. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Bentley et al with an ultrasonic transducer in conjunction with the electrostatic precipitator to remove the solid particulate from accumulating on the collector electrode because the build up on the electrodes would act as an insulator layer and therefore require a higher voltage to attract more particulates out of the mist/gas stream as time goes on.

34. Additional Disclosures Included: Claim 20: The apparatus of claim 4, comprising means for operating the system in alternating dry and wet modes so as to cut down on evaporation losses during operation in the dry mode and thus reduce the water replenishment requirements and to also limit the occurrence of any power losses due to spark discharges to relatively brief wet wash-down periods (See Column 10 lines 13-32).

Double Patenting

35. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

36. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

37. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Art Unit: 1797

38. Claims 1-15 & 19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 & 7-11 of copending Application No. 11/473748. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

39. Claims 1-15 & 19 of the instant application recite a "chamber" and the copending application teaches the chamber to be a "container."

40. Claims 1-15 & 19 of the instant application recite a "volume of ambient air" and copending application teaches this volume to be "ambient air."

41. Claims 1-15 & 19 of the instant application recites "preferably" and copending application teaches this to be "substantial."

42. Claims 1-15 & 19 of the instant application recites a "fine mist of droplets" and copending application teaches this "fine mist of droplets" to be an "injection of water sprays."

43. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Telephonic Inquiries

44. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BOBBY RAMDHANIE whose telephone number is (571)270-3240. The examiner can normally be reached on Mon-Fri 8-5 (Alt Fri off).

Art Unit: 1797

45. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

46. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. R./

/Walter D. Griffin/

Supervisory Patent Examiner, Art Unit 1797